

Defining Personalized Therapies for Handheld Devices

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ABSTRACT

This paper presents a framework that provides psychotherapists with means to tailor specific therapies for their patients. Used artifacts can be easily adapted to the patient's problem, to his evolution rhythm, therapy stage or even to possible filling in situations. Furthermore, the artifacts can be configured to proactively adapt to the patient's behavior, according to previously defined rules, extending the therapist's motivating role. The framework ranges from desktop computers, to mobile devices (e.g. PDAs and TabletPCs) covering therapeutic tasks for both patient and therapist.

Categories and Subject Descriptors

H.5.2 [Information Interfaces and Presentation]: User Interfaces - Prototyping, User-centered design.J.4Social and Behavioral SciencesPsychology

General Terms

Design, Experimentation, Human Factors.

Keywords

Psychotherapy, Active Applications, Handheld devices.

1. INTRODUCTION

Cognitive Behavioral Therapy (CBTs), on specific pathologies such as depression and anxiety may become a long, demanding and sometimes expensive process. Patients are driven, by the therapist, on a self learning and introspective process, replacing, whenever existing, their distorted cognitions with more adequate ones [2]. This requires a multitude of tasks to be performed by the patient and by the therapist, either cooperatively or individually. Therapists define procedures, questionnaires and the therapy itself before each session. On the other side, patients register life events and respective behaviors, schedule activities, etc, throughout the day. During face-to-face appointments, all the data gathered between sessions is transferred between actors.

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Currently, this process is supported mainly by paper or through somewhat recent computer applications. However, due to the diversity of problems and associated therapies as well as the workflow inherent to the process, these solutions present themselves as rigid, sometimes obstructing communication, therapy adaptation and even cooperation during sessions. This also causes delays leading patients to frequently disengage from therapy.

This paper presents a framework that supports the therapist's work, allowing him to tailor the therapy in several dimensions. Furthermore, the resulting artifacts, configured by the therapist, enable patients to ubiquitously perform their tasks during their daily lives with aids and incentives.

2. TAILORING THE THERAPY

SCOPE (Supporting Cognition Outlines on Psychological Evaluation) is a project that addresses the aforementioned problems and aims to solve them [1]. The artifacts that are commonly used on psychotherapy are based on groups of multiple-choice or free-text questions, items or fill-in fields. These items are grouped following pre-defined standards, composing, at times, extensive documents. Moreover, these rarely suited to every situation.

SCOPE offers therapists a way to overcome this problem. It integrates a database of standard items, questions, etc; still allowing therapists to create any other item that is needed. Furthermore, it also supports the customization of each item's presentation (e.g. image, text) and interaction (e.g. multiple-choice item, free-text answer, gauge, drawing, etc). Creating a new questionnaire is resumed to simply selecting a set of items, to arrange them within a sequence and to define their abovementioned characteristics. This flexibility allows therapists do adapt the artifact, its presentation and interaction. For instance, when the patient is a child, the form may be composed mainly by pictures with multiple-choice answers. On the other hand, for an adult, the same items may be textually presented and answered.

It is also noteworthy, that default profiles are included and questionnaire patterns available to be chosen from wizards. To improve usability and promote a simple design and customization process, templates are provided, so that therapists can easily create either generic or more specific tools for their patients. Figure 1 depicts a wizard for creating an image based form. On the left side a list of the selected items is available. The box at the center presents the customization options. Finally on the right, an automatically updated preview of the resulting application is shown.

For each item within a form, a number of answering aids

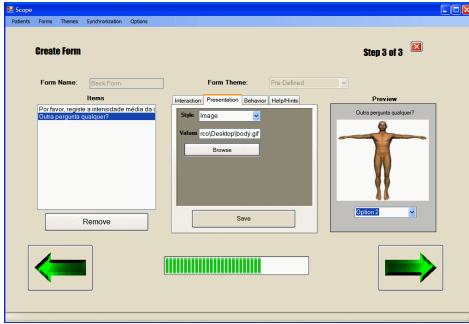


Figure 1: Application Wizard

can be provided. These can also assume various presentation and interaction forms. The therapist, while creating a new artifact or updating an existing one, is able to choose the schedule, type and amount of help that will be provided to the patient aiding him/her and keeping him/her motivated.

3. THERAPY ENDEAVOR

The patient's tool allows patients to engage on therapy as previously defined by the therapist. It reads each created specification materializing it into a pro-active artifact. Each task that is usually done during therapy is replicated and enhanced so the effort in accomplishing it is diminished and the focus directed to the content that needs to be provided. For instance, multiple-choice questionnaires are easily filled by selecting the correct answer. However, browsing the questionnaire forth and backwards allows patient's to update questions at any given time without creating confusing or unreadable documents. Furthermore, each of these updates is stored and provided for later analysis. On thought registers, specific fields are generally provided (e.g. situation, emotion, behavior, etc) and hierarchically presented in order to facilitate the filling-in process.

Activity scheduling is also improved since recurrent activities are available for the patient to choose and the day is divided into several slots for an easier organization. On this aspect, later classification of each activity is also possible. During each of these tasks, the application adapts to the patient's behavior, according to the rules that were defined by the therapist.

4. EVALUATION

The therapist framework and corresponding patient's tool are currently being used on a clinical setting. However, these were firstly evaluated during two months by several users with different backgrounds. The therapist's framework was tested by a group of three practicing therapists and two researchers. A larger group of users from various backgrounds was responsible for carrying a mobile device with the therapy tool for several days.

4.1 Results

To validate the expectations regarding the customization capabilities of the system, the main goal during this stage was to replicate and enhance existing and successfully used psychotherapy applications. Accordingly, these tasks were accomplished by therapists.

Anxiety: most of the available applications which address anxiety problems rely on relaxation tutorials or anxiety assessment inventories [3]. With SCOPE, therapists were able to adjust tutorials for similar procedures, even including exemplifying images, hints on how to execute the movements as well as a classifying field on the effectiveness of the results. For the anxiety inventories, therapists selected a simple arrangement of a few items and the correspondent levels of intensity for each (e.g. Beck Anxiety Inventory, Max Hamilton Test).

Depression: pleasant Activity Scheduling is a common practice during depression therapy. Using SCOPE, therapists were also able to compose a simple scheduling form which integrated classification fields for each task that was scheduled. Hints were added mainly as lists of common activities that could be selected for a slot within a day. Alarms were also defined for these forms so that final users were alerted when tasks needed to be scheduled.

Pain and Weight: for the treatment of pain associated disorders, therapists created image based forms. One of the resulting forms displays body images where users point the location of the pain directly on the image. Associated to each image is a set of questions related to pain intensity, used medication or associated symptoms. Some forms addressing weight associated problems were also created. These were mainly questionnaire based but some also incorporated a thought registration component.

5. CONCLUSIONS AND FUTURE WORK

This paper presents a novel approach which addresses the majority of current problems faced within psychotherapy. It ranges through every common task allowing a flexible personalization of the used artifacts, facilitating the prescription, analysis and filling-in process.

The framework is being used on a clinical environment where new usages are already being discovered. The achieved flexibility allows therapists to replicate previously successfully used tools, to extend them and adjust them in several ways. A continuation of this project, which deals with group therapy sessions is already being developed. Besides providing individual support for each patient, this newer version provides streams of communication within group therapy scenarios.

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